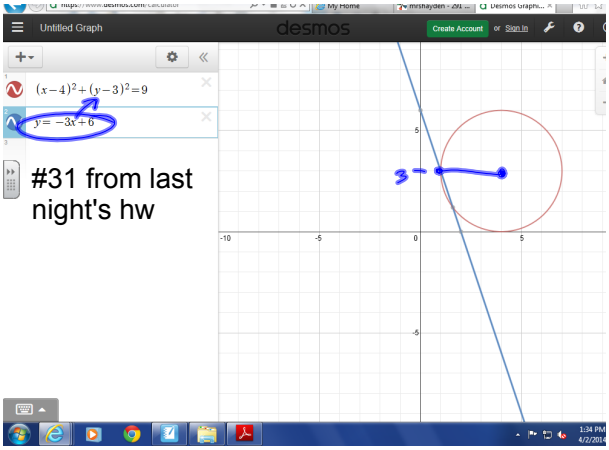


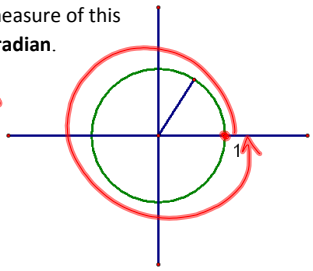
#31 from last night's hw

Radians

A radian is defined using the unit circle, which is a circle with a radius of 1 unit centered at the origin. When a central angle intercepts an arc that has the same length as a radius of the circle, the measure of this angle is defined to be one **radian**.

$C = 2\pi = 360°$

$\pi = 180°$



The circumference of a circle is $2\pi r$, where r is the length of a radius. There are 2π radians in one complete revolution about a point and one complete revolution equals 360°.

2π radians = 360° π radians = 180° 1 radian ≈ 57.3°

Convert each degree measure to radian measure.

a. 120° b. -245°

$120\left(\frac{\pi}{180}\right) = \frac{2\pi}{3}$

$-245\left(\frac{\pi}{180}\right) = \frac{-49\pi}{36}$

Convert each radian measure to degree measure.

a. $\frac{\pi}{3}$ radians b. $-\frac{3\pi}{4}$ radians

$\frac{\pi}{3} \cdot \frac{180}{\pi} = 60°$

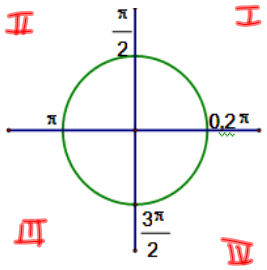
$\frac{-3\pi}{4}\left(\frac{180}{\pi}\right) = -135°$

Quadrant I if $0 < \theta < \frac{\pi}{2}$

Quadrant II if $\frac{\pi}{2} < \theta < \pi$

Quadrant III if $\pi < \theta < \frac{3\pi}{2}$

Quadrant IV if $\frac{3\pi}{2} < \theta < 2\pi$



In which quadrant or on which axis does the terminal side of the angle lie?

a. $\frac{4\pi}{3}$ III

b. $-\frac{5\pi}{4}$ II

c. $\frac{9\pi}{2}$ positive y-axis

Degrees, Minutes, Seconds

40° 8′ 19″ N, 75° 11′ 29″ W

1 minute (1′) = $(\frac{1}{60})^\circ$ 1 second (1″) = $(\frac{1}{60})'$ or $(\frac{1}{3600})^\circ$

Convert each angle measure as indicated.

a. 12.464° to degrees, minutes and seconds, to the nearest second.

$.464(60) = 27.84'$

$.84(60) = 50.4''$ $12^\circ 27' 50''$

b. 23°42′45″ to decimal degrees, to the nearest tenth.

$23 + \frac{42}{60} + \frac{45}{3600} = 23.7^\circ$